

CLAIMS

1. A map displaying apparatus that obtains map data including curved-point coordinate information and name information of a traffic route for displaying the traffic route individually, which is transmitted from a map-data distributing server via a network, and displays a map based on the obtained map data, the map displaying apparatus comprising:
 - 10 a display-area determining unit that determines a display area in which the map is to be displayed;
 - 15 an obtaining unit that obtains, from the map data transmitted from the map-data distributing server, the curved-point coordinate information and the name information of the traffic route to be displayed in the display area determined by the display-area determining unit; and
 - 20 a map-display-data generating unit that determines a display position of each character or each symbol included in a character/symbol string in the name information so that the character or the symbol is positioned along the traffic route without interfering with other character or symbol, and generates map display data for displaying the character or the symbol at the determined display position.
- 25 2. The map displaying apparatus according to claim 1, wherein
 - when a display angle of the character or the symbol included in the character/symbol string in the name information is rotatable, the map-display-data generating unit determines the display angle of the character or the symbol so that the character or the symbol is positioned along the traffic route, and generates the map display data so that the character or the symbol included in the

character/symbol string is sequentially displayed from left to right on a display screen.

3. The map displaying apparatus according to claim 1,

5 wherein

when a display angle of the character or the symbol included in the character/symbol string in the name information is not rotatable, the map-display-data generating unit determines a direction in which the 10 character or the symbol included in the character/symbol string is to be displayed sequentially on a display screen, based on an inclination angle of the traffic route with respect to a predetermined direction of the display screen, and generates the map display data for sequentially 15 displaying the character/symbol string in the determined direction.

4. The map displaying apparatus according to claim 3,

wherein

20 when the display angle of the character or the symbol included in the character/symbol string in the name information is not rotatable, the map-display-data generating unit generates the map display data for displaying the character or the symbol included in the 25 character/symbol string from left to right if the inclination angle of the traffic route with respect to a horizontal direction of the display screen is smaller than a predetermined angle, and for displaying the character or the symbol included in the character/symbol string from top 30 to bottom if the inclination angle of the traffic route with respect to the horizontal direction of the display screen is equal to or larger than the predetermined angle.

5. The map displaying apparatus according to claim 1, wherein

upon judging whether the character or the symbol included in the character/symbol string in the name information interferes with the other character or symbol, the map-display-data generating unit uses a judgment character pixel range that is larger than a pixel range for displaying a single character or a single symbol, and judges whether the pixel range of the other character interferes with the judgment character pixel range.

6. A map displaying apparatus that obtains map data including curved-point coordinate information and name information of a traffic route for displaying the traffic route individually, which is transmitted from a map-data distributing server via a network, and displays a map based on the obtained map data, the map displaying apparatus comprising:

a display-area determining unit that determines a display area in which the map is to be displayed;

an obtaining unit that obtains, from the map data transmitted from the map-data distributing server, the curved-point coordinate information and the name information of the traffic route to be displayed in the display area determined by the display-area determining unit; and

a map-display-data generating unit that generates map display data for displaying a character/symbol string in the name information along the traffic route, wherein

before generating the map display data for displaying the character/symbol string in the name information corresponding to the traffic route along the traffic route, the map-display-data generating unit judges whether the map

display data for displaying the character/symbol string in the display area determined by the display-area determining unit is generated, and if the map display data is generated, the map-display-data generating unit does not generate the
5 map display data for displaying the character/symbol string in the name information of the traffic route.

7. A method of obtaining map data including curved-point coordinate information and name information of a traffic
10 route for displaying the traffic route individually, which is transmitted from a map-data distributing server via a network, and displaying a map based on the obtained map data, the method comprising:

15 determining a display area in which the map is to be displayed;

obtaining, from the map data transmitted from the map-data distributing server, the curved-point coordinate information and the name information of the traffic route to be displayed in the display area determined at the
20 determining; and

generating including

25 determining a display position of each character or each symbol included in a character/symbol string in the name information so that the character or the symbol is positioned along the traffic route without interfering with other character or symbol; and

generating map display data for displaying the character or the symbol at the determined display position.

30 8. A method of obtaining map data including curved-point coordinate information and name information of a traffic route for displaying the traffic route individually, which is transmitted from a map-data distributing server via a

network, and displaying a map based on the obtained map data, the map displaying apparatus comprising:

 determining a display area in which the map is to be displayed;

5 obtaining, from the map data transmitted from the map-data distributing server, the curved-point coordinate information and the name information of the traffic route to be displayed in the display area determined at the determining; and

10 generating map display data for displaying a character/symbol string in the name information along the traffic route, wherein

 before generating the map display data for displaying the character/symbol string in the name information

15 corresponding to the traffic route along the traffic route, the generating includes judging whether the map display data for displaying the character/symbol string in the display area determined at the determining is generated, and not generating the map display data for displaying the

20 character/symbol string in the name information of the traffic route if the map display data is generated.

9. A map-displaying program for obtaining map data including curved-point coordinate information and name information of a traffic route for displaying the traffic route individually, which is transmitted from a map-data distributing server via a network, and displaying a map based on the obtained map data, the map-displaying program causing a computer to execute:

30 determining a display area in which the map is to be displayed;

 obtaining, from the map data transmitted from the map-data distributing server, the curved-point coordinate

information and the name information of the traffic route to be displayed in the display area determined at the determining; and

generating including

5 determining a display position of each character or each symbol included in a character/symbol string in the name information so that the character or the symbol is positioned along the traffic route without interfering with other character or symbol; and

10 generating map display data for displaying the character or the symbol at the determined display position.

10. A map-displaying program for obtaining map data including curved-point coordinate information and name 15 information of a traffic route for displaying the traffic route individually, which is transmitted from a map-data distributing server via a network, and displaying a map based on the obtained map data, the map-displaying program causing a computer to execute:

20 determining a display area in which the map is to be displayed;

obtaining, from the map data transmitted from the map-data distributing server, the curved-point coordinate information and the name information of the traffic route 25 to be displayed in the display area determined at the determining; and

generating map display data for displaying a character/symbol string in the name information along the traffic route, wherein

30 before generating the map display data for displaying the character/symbol string in the name information corresponding to the traffic route along the traffic route, the generating includes judging whether the map display

data for displaying the character/symbol string in the display area determined at the determining is generated, and not generating the map display data for displaying the character/symbol string in the name information of the 5 traffic route if the map display data is generated.